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Water and Sanitation in the News

Turning waterless toilets into clean water and power

How it works

The toilet's magic happens when you close the lid. The bottom of the bowl uses a rotation mechanism to sweep the waste into a sedimentation chamber, which helps block any odors from escaping. The waste is then filtered through a special nanotech membrane, which separates vaporized water molecules from the rest of the waste, helping to prevent pathogens and solids from being carried further by the water.

The vaporized water then travels through to a chamber filled with "nano-coated hydrophilic beads", which helps the water vapour condense and fall into a collection area below. This water is pure enough to be used for household washing and farm irrigation.

The residual solid waste and pathogens are driven by an archimedean screw into a second chamber. This part of the design is still being finalized, but the current plan is for the solid waste to be incinerated to convert it into ash and energy. The energy will power the nano membrane filtration process, with enough left over to charge mobile phones or other small devices. The only waste product of the whole process is ash from the burning of solids, which is nutrient-rich and pathogen free, and therefore, usable in farming. The toilet can manage the waste generated by households of up to 10 people.

The nano membrane toilet is funded in part by the Bill & Melinda Gates Foundation's Reinvent the Toilet Challenge, and is the winner of the CleanEquity Monaco 2015 award.

Search for innovation

Currently, more than 650 million people in the world do not have access to clean water, and more than 2.3 billion don't have access to a safe, private toilet. Researchers around the world are working to help solve this problem, but high-tech solutions, such as adding solar panels, are usually too expensive to be practical. Sociological issues also play a role. As toilet infrastructure deteriorates, people prefer to go outside rather than use a smelly room inside their house. This makes women vulnerable to rape, and creates further sanitation and hygiene issues. The nano membrane toilet is clean, odourless and aspirational, and it should be capable of working in environments that lack sewage, external power and water. So it will be interesting to see how it works in the field.

The plan is for the toilet to be rented to households through a local organisation, helping to spread the costs to stay within the Gate Foundation's challenge of keeping the cost of the toilet below US 5 cents per person per day. If all goes well, the toilet could also find applications elsewhere like the military, construction industry, yachts, or outdoor events.

Sources: Infrastructurenew.ws, 06 January 2016

Innovative technologies and systems have a vital role to play in the global water services sector. Besides addressing water quality and quantity challenges, ground-breaking technologies could result in significant economic benefits for a country in terms of water and energy savings and provide much needed support in achieving development goals. At the moment in South Africa and regionally, an all hands on deck approach is needed where a collaborative re-thinking and re-invention is needed not only in terms of implementing new water conservation technologies and systems, but also new policies and behaviours.

The **Municipal Assistant™** forms part of such a broader collaborative solution in that the system is constantly reinvented and adapted according to the needs and regulatory requirements of successfully managing operations and assets at WTWs and WWTWs and other municipal departments. It has all the critical tools to support local municipalities in the sustainable use and management of their water resources and the achievement of Blue and Green Drop certification.

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